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CHANGES IN GREGG SHORTHAND SIMPLIFIED AS WRITTEN DURING EMPLOYMENT--AN ANALYTICAL STUDY OF VARIATIONS IN A PHONETIC SYSTEM OF COMMUNICATION.

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DESCRIPTORS- *HANDWRITING SKILLS, STENOGRAPHY, *SHORTHAND, *OFFICE PRACTICE, OFFICE OCCUPATIONS, BUSINESS SUBJECTS, *COMPARATIVE ANALYSIS, NEW YORK CITY, GREGG SHORTHAND (SIMPLIFIED EDITION)

VARIATIONS FROM "STANDARD GREGG SHORTHAND" IN THE SIMPLIFIED EDITION WERE INVESTIGATED AFTER USE IN EMPLOYMENT TO DETERMINE INTERRELATIONSHIPS AND TO MODIFY AND REFINE THE "GREGG SHORTHAND SIMPLIFIED" PRINCIPLES AND PROCEDURES. SAMPLES OF SHORTHAND, WRITTEN BY WRITERS WHO HAD AT LEAST 2 YEARS OF INSTRUCTION IN "GREGG SHORTHAND SIMPLIFIED," WERE PROCURED FROM NOTEBOOKS USED EVERYDAY ON THE JOB. EVIDENCE SUPPORTED THE HYPOTHESIS THAT, ALTHOUGH CERTAIN KEY ELEMENTS IN "GREGG SHORTHAND SIMPLIFED" ARE NOT FOLLOWED ACCURATELY, SHORTHAND WRITERS WRITE ESSENTIALLY TEXT SHORTHAND DURING EMPLOYMENT. IT WAS CONCLUDED THAT THE SIMPLIFED SHORTHAND, AS IT WAS TAUGHT, SERVED ITS PURPOSE. (GD)

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Project Director

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SUMMARY

CHANGES IN GREGG SHORTHAND SIMPLIFIED AS WRITTEN DURING EMPLOYMENT; AN ANALYTICAL STUDY OF VARIATIONS IN A PHONETIC SYSTEM OF COMMUNICATION

PURPOSE

The purpose of the study was to investigate variations from Standard Gregg Shorthand in the Simplified Edition, after use in employment, to determine relationships of variations to principles and procedures of Gregg Shorthand Simplified, and to determine implications of these relationships for modification of the Gregg Shorthand Simplified principles and procedures.

PROCEDURES

Delimitations. Samples of Gregg Shorthand Simplified already written were sought only in a natural context, i.e., on the job, from notebooks used everyday in order to obtain the shorthand as written in common usage. The study was made only of the shorthand of writers who had at least two years of instruction, or the equivalent, to provide a uniform minimum preparation. Written samples were collected only from people who had studied Simplified Shorthand to determine if variations were the same or different among national

geographic areas.

Adequacy of samples. Samples were collected until no new variations appeared, and the last 100 words made no difference, fulfilling purposes of the project. Ultimately, 212 samples were retained as satisfactory for purposes of the study and had 133,380 shorthand outlines representing 162,544 words.

Steps. 1. Groups of samples. The first 25 samples collected were set aside as a preview. The main body of samples from a national collection supplied the largest source of data for the study. The last 25 samples of shorthand were dictated by the investigator at varying speeds to shorthand writers on the job to see if speed made any difference in the number of variations.

2. The next step was to determine kinds of variations important to Simplified theory, identify variations by kind, record, organize the variations, and cross reference each to its original source for ready reference. Shorthand experts agreed that the kinds of variations were important and were located accurately and completely.

3. Totals were computed and variations summarized as preparation for analysis and interpretation.

Local samples were collected by the investigator. The national collection was made by mail with the aid of the Administrative Management Society, which had branch members

throughout the United States.

When national samples were received, they were completely anonymous as to shorthand writer and business firm. Also, respondents had the option of refusing to send samples previously written, and it is reasonable to believe there was no incentive or motivation for them to bother going to the trouble of dictating special material. Moreover, local and national findings were mutually supporting.

The total number of shorthand outlines and words represented were found by estimation from a detailed count of a part, a recognized method used by scholars.

Shorthand experts were used since jury opinion is an extension of the method of logical validation; and confirmation may be obtained from a group of persons who would be considered expert in the field. Nine shorthand experts worked individually in three different groups for this study, some serving in two of the groups. Group I approved the list of kinds of variations as important to Simplified theory. Group II sampled the raw data and agreed that the variations were located accurately and completely. Group III of outstandingly well-qualified experts reached agreement without difficulty on the investigator's interpretations of the data.

Kinds of variations. The kinds of variations studied are listed as follows:

1. Use of left and right "s."

2. Confusion of "o" and "oo."
3. Circle vowels ("a" or "e") between opposite curves.
4. Circle vowels ("a" or "e") in relation to straight strokes.
5. Use of "-ings."
6. "-ith" joining and its misuse.
7. Representation of the word ending "-ther."
8. Past tense "-ed," "-ded, and "-t."
9. Treatment of amounts and quantities.

It was assumed that two years of instruction in Gregg Shorthand Simplified theory principles and procedures were reasonable time for learning. It was also reasonable to assume that the rules and procedures were learned in that time and that variations from these rules and procedures was made by the shorthand writer.

A check of the actual work the investigator had done made when the shorthand experts individually sampled the raw data and reached agreement without difficulty that the variations were being located accurately and completely.

A sample of the identification of variations on pages of shorthand writing was given as an illustration. Forms the variations took were also shown for each of the kinds of variations.

The variations were then recorded by kind and by

geographic group in an orderly, logical fashion, identified by the number of their samples and cross referenced to the original case for future reference. Shorthand outlines with variations were reproduced in India ink as nearly like originals as possible. From the data, 112 pages were compiled showing minutely the shorthand outlines with variations for 162,544 words studied. Each variation was accompanied by a corresponding printed word to show the shorthand outline meaning.

Since the review samples had dictation speeds of 60, 80, 100, and 120 words a minute, these variations were shown separately within each of these speeds.

All cases of variations were totaled, summarized, and described in detail for each group of samples.

ANALYSIS OF THE DATA

Ten letters containing common business letter material were selected at random from 30 issues of the magazine, The Business Teacher. One hundred words from the body of each letter for a total of 1,000 words were taken and transcribed. This was an adequate number of words to provide examples of all kinds of variations studied.

The remaining steps are given as an illustration and were taken for each kind of variation and for all groupings of samples:

1. In the shorthand outlines of 1,000 words, there occurred 130 left "s's." Dividing 130 by 1,000 gave a ratio

of .130.

2. This ratio of .130 when multiplied by all the words of any grouping, e.g., 162,544, gave an estimated total left "s's" of 21,130.72.

3. The number of variations of left "s" written on the job, 151, was compared with the estimated total left "s's," 21,130.72, deriving by division, an index of variations of .0071 for interpretation.

Interpretations were made from summaries of the indexes of variations for all groups of samples and from comparisons between special groups, and were approved individually by shorthand experts until reasonable agreement was reached without difficulty.

The indexes of variations provided a reasonably accurate and convenient method of interpreting the importance of frequencies of variations in 162,544 words to Gregg theory principles and procedures. No specific index was designated as a definitive point of significance for diminishing returns because further research will have to determine what number of cases of variations is the standard for minimum importance to Gregg principles and procedures.

The reader is reminded that "index of variations" means the decimal obtained by dividing the actual variations in shorthand outlines of this study by the estimated total possible cases.

A word of caution is presented about assuming any

results as representative of standards beyond the scope of this study. For example, this study does not propose to determine "expected variations." Estimated cases are different; they are the total possible occurrences of each kind of variation, e.g., left "s," studied in 162,544 words of this investigation. It is an extremely remote probability that 100 per cent of the estimated total possible cases of occurrence of left "s" would be written incorrectly as variations. Occurrences of left "s" are different from variations among occurrences; therefore, "estimated cases of occurrence of left 's'" are not to be confused with an unknown "expected variations"; and in no part of this study are the terms interchangeable.

Validity. A valid test has been defined as one that measures what it is supposed to measure. A jury of shorthand experts sampled the raw data and agreed unanimously that the variations were located accurately and completely for purposes of the study. It is recognized by scholars that jury opinion is an extension of the method of logical validation. The jury fulfilled requirements for expertness in the field.

Consistency. This study has functional statistical consistency, appropriate to the design of the investigation. The size of the sample was adequate, since 133,380 shorthand outlines representing 162,544 words were studied until no new variations appeared and the last 100 words made no

difference in the results.

By using adequate sample size, a similar operational plan, and by deriving indexes of variations, any trained researcher can demonstrate a number of findings.

FINDINGS AND INTERPRETATIONS BASED ON INDEXES OF VARIATIONS

1. Total past tense "-ded," "-ed," and "-t." There were 20 variations written out of 100 possible cases. Interpretation. Modifications were written in a high number of cases during employment. Conclusion. Simplified principles and procedures were not serving their purposes. Diamond Jubilee revisions have met this need by joining the last sound heard.

2. Total for treatment of amounts and quantities. There were 16 variations out of a possible 100. Interpretation. Shorthand writers did not remember to use this principle on the job a significant number of times in daily writing. Conclusion. Simplified theory did not serve its purpose. The Diamond Jubilee System met this need to the extent that it revised the Simplified rule.

3. Total "-ings" word ending. There were seven variations in 100 possible cases. Interpretation. There were more variations than could positively be accounted for reasonably by accident or carelessness. Conclusion. The Simplified rule was not serving its purpose.

4. Total circle vowels ("a" or "e") between opposite curves. Only three variations out of 100 occurred. Interpretation. Standard shorthand was used, for the most part, on the job. Conclusion. Gregg Simplified theory was used and served its purpose.

5. Total for confusion of "o" and "oo." Less than one variation, .8, was written in 100 possible times. Interpretation. Such a low occurrence meant that text shorthand was used mainly in everyday writing. Conclusion. This Gregg principle was used almost all the time on the job.

6. Total "-ith" joining. Only .8 of one variation occurred in 100 possible cases. Interpretation. It was judged that shorthand theory learning was satisfactorily used on the job. Conclusion. Simplified theory served its purpose.

7. Total left and right "s." Just .6 of a variation was written in 100 cases. Interpretation. Shorthand writers used typical text shorthand on the job. Conclusion. Simplified theory was learned and written during employment.

8. Total circle vowels ("a" or "e") in relation to straight strokes. Only .5 of a variation occurred in 100 times. Interpretation. Text shorthand was written accurately, for the most part, on the job. Conclusion. Simplified theory served its purpose for this kind of variation.

9. Total "-ther" ending. The lowest frequency of .2 for 100 cases occurred here. Interpretation. These few

variations could easily have been caused by accident or carelessness. Conclusion. Standard shorthand was used on the job for the most part.

A comparison of variations for local and national samples. The local average of variations per sample was 8.5, and the national was 8.1. Interpretation. The difference of .4 was so low as to be negligible. Conclusion. Simplified theory is written with very little difference by shorthand writers during employment throughout the country.

A comparison of variations per minute for review samples at dictation rates of 60 to 120 words a minute. Averages per minute of citation for variations were computed as follows: 1.7 - 60, .7 - 80, .8 - 100, and 1.3 - 120 words a minute. Interpretation. Since variation averages per minute decreased as the speed increased, it appeared that there was not much difference in the averages of variations per minute. Conclusion. Speed did not appear to be a decisive factor in the number of variations made per minute as dictation rates increased from 60 to 120 words a minute.

A comparison of variations for preview and main body samples. Averages, computed per word for both groups, were found to be .0096 for preview and .0117 for main body samples. Interpretation. The difference of .0021 was such a low amount that there was consistency in the number of variations for

the two groups. Conclusion. The variations in both groups were so nearly the same that it is reasonable to say that the first 25 samples collected, called the preview, reasonably predicted the number of variations that occurred in the samples collected later, called the main body group.

A comparison of variations for main body and review samples. Averages per word were computed for variations and were found to be .0117 for the main body and .0112 for the review. Interpretation. The difference of .0005 was so low that it was judged that variations were similar for the main body and review groups. Conclusion. The variations for both groups were so consistent that it was reasonable to say that the last 25 samples collected, called the review group, reasonably repeated the number of variations in the main body.

IMPLICATIONS FOR GREGG SIMPLIFIED THEORY

Past tense "-ded" and "-ed." The Gregg Simplified principles and procedures for the past tense forms for "-ded" and "-ed" did not appear to serve their purposes. The advisability of teaching these principles and procedures is doubtful. Diamond Jubilee's revision by adding the last sound heard for the past tense was justified by the findings of this study.

Treatment of amounts and quantities. Simplified theory

principles and procedures for treatment of amounts and quantities were not remembered or written in a significant number of words, and did not serve their purposes. It does not seem necessary to teach these rules in their present form. Diamond Jubilee's revisions by writing fully in shorthand certain outlines for amounts and quantities, such as cents, and abbreviations, such as bushels, have met this need in part.

The other two kinds of variations, "-ings" ending and circle vowel "a" between opposite curves, had so high a number of variations that they could not be explained by accident or carelessness. The implication is that they were not meeting the needs of shorthand writers on the job and require critical examination for modification of the Gregg principles and procedures.

All the remaining kinds of variations had such low frequency that Gregg Simplified theory was serving its purposes and was written satisfactorily, as far as variations were concerned, during employment.

OVERALL CONCLUSIONS

1. Evidence of the study supported the hypothesis that although certain key elements in Gregg Shorthand Simplified were not followed accurately, shorthand writers, except for slight carelessness and accidents, did write essentially plate shorthand during employment. Shorthand, as it was

taught, served its purpose.

2. By and large, where the Diamond Jubilee Shorthand System has not revised the Simplified principles and procedures, shorthand writers do use standard shorthand during employment. Where evidence of this study showed that shorthand writers did not use Standard Simplified Shorthand, Diamond Jubilee has met this need.

3. The low frequency of marked variations from Gregg Shorthand Simplified principles and procedures among shorthand writers showed that, although individual cases may have functioned effectively, the shorthand writers who were on the job generally used text shorthand.

4. From evidence of this study of Gregg Shorthand Simplified, speed was not a decisive factor in the number of variations written during employment.

5. Gregg Shorthand Simplified was written with no essential difference by shorthand writers during employment throughout the country.

6. The samples of shorthand written throughout the country are, in the opinion of the investigator, evidence that shorthand is functioning at least in one step as a vital part of the written language of business communication. Shorthand theory is in the process of changing, very much as a written language changes, to meet the needs of shorthand writers.

7. There are implications for general education at all levels of teacher education, the investigator believes, and

for teachers in the field: What is learned stays essentially learned, and it behooves teachers to be aware that aspects of learning situations will stay learned.

RECOMMENDATIONS

The following recommendations are made for further study:

Devise a Gregg Shorthand system with no choicemaking in the writing of any individual shorthand outline, such as left or right "s," over or under "-ith," and "o" and "oo" hook; and test experimentally with a control group to see what the results are. (The everyday business office situation is not appropriate for technical and accurate testing.)

Determine the frequency of cases of sounds per 1,000 words for all kinds of variations from Gregg Shorthand text principles and procedures.

Study the importance of variations from Gregg Shorthand principles and procedures when dictation is given at varying speeds.

ADDENDUM

WORDS WITH VARIATIONS. Words with variations contained in their shorthand outlines were studied and reported as a supplementary resource for the benefit of researchers, teachers, and students.

In addition to listing every word which occurred at least once with a variation for every group of samples, summary tables, appearing in the Appendix, were made of the words with variations occurring more than once.

TABLE OF CONTENTS

	Page
STATEMENT OF THE PROBLEM	1
IMPORTANCE OF THE STUDY	1
DELIMITATIONS	5
DEFINITION OF TERMS	6
HYPOTHESIS	6
ASSUMPTIONS	7
RELATED LITERATURE	7
PROCEDURES OF COLLECTION AND PREPARATION OF THE DATA	8
Delimitations	8
Primary sources	9
Adequacy of samples	9
Procedures	9
Collection of data	11
Method for calculating number of outlines, words represented, and lines of writing	15
Review group of samples	16
Shorthand experts	16
Kinds of variations	19
Gregg theory principles and procedures pertaining to kinds of variations	19
Identification of variations	19
Forms of the variations	21
Recording the variations	21
General summary of variations in shorthand outlines	22
ANALYSIS OF THE DATA	22
Method of estimating cases	22
Indexes of variations	26
Interpretation of indexes of variations	26
SUMMARY OF FINDINGS, INTERPRETATIONS, AND CONCLUSIONS	30
Summary of each kind of variation	30
Summary of totals of variations	35
SUMMARY OF THE COMPARISON OF VARIATIONS FOR LOCAL AND NATIONAL SAMPLES	38

Page

SUMMARY OF VARIATIONS IN REVIEW SAMPLES 39

SUMMARY OF A COMPARISON OF VARIATIONS FOR PREVIEW AND MAIN BODY SAMPLES. 40

SUMMARY OF A COMPARISON OF VARIATIONS FOR MAIN BODY AND REVIEW SAMPLES 41

Validity 42
Consistency. 43

SUMMARY OF IMPLICATIONS FOR GREGG THEORY. 44

OVERALL CONCLUSIONS 45

RECOMMENDATIONS 48

BIBLIOGRAPHY. 49

APPENDICES. 51

LIST OF TABLES

Tables		Page
I.	Summary of Distribution of Samples of Gregg Shorthand Simplified Outlines and Words Represented	17
II.	Kinds of Variations from Gregg Shorthand Simplified Rules and Procedures	20
III.	Variations in the Use of Left and Right "s" in Outlines of Preview Samples #1-25, Representing 17,825 Words	23
IV.	Summary of Variations.	24
V.	Review Variations for Dictation Speeds of 60, 80, 100, 120 Words a Minute	25
VI.	Ratios of Possible Occurrences Studied to 1,000 Typical Words Arranged in Order for Nine Kinds of Variations.	27
VII.	Estimated Total Possible Cases in Nine Kinds of Variations for All the Samples	28
VIII.	Indexes of Variations for All the Samples with 162,544 Words.	37

LIST OF FIGURES

Figures		Page
2.	A Letter to Obtain National Samples of Gregg Shorthand Simplified	51
3.	Enclosure for Collection Letter of Figure 2	52

FOREWORD

It is often assumed that shorthand writers vary from principles and procedures of shorthand theory in their outlines written frequently and that unusual forms are simplified. Which is better: the shorthand taught or what is written on the job everyday? What are the variations? Is it necessary to teach certain rules found basic to the variations?

The results of this study were surprising. On the whole, students of Gregg Shorthand Simplified in schools mastered the art quite well and stayed close to the outlines learned when the skill was adapted to the job situation. Evidently teachers were thorough in achieving mastery. The skill can be learned efficiently in high school. The way shorthand is learned is the way it is used on the job.

No pretense was made that complete reliability was attained in this study. However, the practical results indicated that the judgment resulting from this study can be used with considerable safety. Other studies are needed and would be desirable to duplicate the procedures used here. Assuming that teachers give reasonably good instruction and

that students are adequately motivated, the results are in accord with basic findings of educational psychology.

This study clarifies with considerable definiteness an area of uncertainty in the teaching of shorthand. A number of similar investigations will materially improve the teaching and learning of shorthand theory.

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July 15, 1966

STATEMENT OF THE PROBLEM

The central focus of the study was an investigation of variations from Standard Gregg Shorthand in the Simplified Edition after use in employment to determine relationships of variations to principles and procedures of Gregg Shorthand Simplified, and to determine implications of these relationships for modification of the theory of Gregg Shorthand Simplified.

IMPORTANCE OF THE STUDY

Gregg Shorthand Simplified has an established place in the secondary curriculum of public schools as a system of written communication. According to verified figures from the Gregg Publishing Division of the McGraw-Hill Book Company, Gregg Shorthand is taught in 99.91 per cent of the cities and towns in the United States where high schools teach shorthand.

Educational administrators, supervisors, and college students in teacher-training programs for business education have a professional stake and a logical need for the findings of a critical examination of the changing nature of principles and procedures of Gregg Shorthand Simplified, which is an essential part of the curriculum of business

education of secondary schools.

Faculty who teach Gregg Shorthand Simplified may find outcomes of this investigation important because the effectiveness of this system of communication may be influenced by the possibility of modification of theory following a critical examination of variations.

This investigation is the first to study the theory of Gregg Shorthand Simplified on the basis of usage in employment. There is a gap in knowledge about this subject as evidenced by intensive search of the following standard sources which indicate a lack of research on this topic:

Dissertation Abstracts, January 1952-November, 1963
Doctoral Dissertations Accepted by American Universities, Vols. I-XXVI, 1933-63
Education Index, January, 1929-January, 1964
Index to American Doctoral Dissertations in Education in Progress or Completed at Colleges and Universities in the United States, 1933-63
List of American Doctoral Dissertations, 1913-63
Microfilm Abstracts of Doctoral Dissertations, 1938-51
National Business Education Quarterly, Summaries of Studies and Research, Vols. XXVIII-XXXI, 1956-63
Phi Delta Kappan Dissertations under Way and Completed, April, 1938-January, 1964
Readers Guide to Periodical Literature, July, 1932-January, 1964

Whether or not findings will indicate a revision, an investigation from this point of view is needed to add to the general fund of information concerning the system of communication known as Gregg Shorthand Simplified.

The Vocational Education Act became law in December, 1963. A monetary outlay was approved for vocational

training, including office work, to a maximum of $225 million.[1] Gregg Shorthand Simplified is one of the areas of training for office employees, and needs to be examined critically and revised, if necessary, in order to bring the most effective training to students. This study was such a critical examination.

The U. S. Office of Education made a grant of $6,734 under the Small Contract Division of the Cooperative Research Program to this study for investigation of its purposes.

The most effective Gregg Shorthand system possible is needed by a particular group of people in the labor force of this nation. In 1960, according to the United States Census Bureau, there were approximately two million people employed in occupations requiring shorthand and typewriting skills; and more than 95 per cent of those employees were women. The group is significant in numbers, in representation because the secretary has long been the personification of employed women, and in the talent that women add to the total fund in the labor force. Robert E. Slaughter pointed out in "Shorthand and Society" that the future of the world may depend on the availability of a supply of human talent that is adequate

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[1] Fred M. Hechinger, "Education," New York Times, December 22, 1963, Section IV, p. 8.

in quality and quantity.

Slaughter described the contribution that shorthand makes to fill some of the needs of society:

> Shorthand contributes to the productivity and efficiency of our business, our industry, and our professional and institutional enterprises in America. Shorthand is vitally used in conducting the operations of business, of industry, and of the professions because of their dependence on communications, and particularly on the communications process that involves recording from dictation reports, correspondence, and other documents.[2]

Gregg Shorthand was originally developed with the intent of universal usage. Monetary needs influenced the author, John Robert Gregg, to direct his efforts toward development of the system for vocational purposes in this country. Gregg Shorthand has been taught in foreign countries, thus serving even larger areas and somewhat fulfilling the original intent of the author for universality.

Gregg Shorthand has held its leadership as the shorthand system most widely taught in spite of controversy and competition, such as notehand and stenotyping for special limited needs.

A supplementary purpose of the study was to make the findings available to libraries for future investigation and

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[1]Robert E. Slaughter, "Shorthand and Society," Business Education World, Vol. XLIII, January, 1963, p. 10.

[2]Ibid., p. 11.

research in phonetic communication in the field of linguistics. The New York Public Library has a large collection of shorthand items, preserved in perpetuity and available for public and private use.[1]

DELIMITATIONS

This investigation used Gregg Shorthand samples of writers who studied only the Simplified Edition of 1949 because no earlier system was intended to be the subject of this study.

It was not the purpose of this project to measure or select the methods of teaching or the quality of instruction received by the writers of shorthand samples since they were written in employment after the text content was learned.

Rigorous testing was not done nor was a control made of the type of material that was being noted in the shorthand system because the investigation used the procedure of elemental analysis for variations in structural graphic symbols. The use of dictated material is itself a control. The shorthand specimens themselves, also, are a degree of natural control and delimit the data.

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[1]Karl Brown and Daniel D. Haskell, Compilers, The Shorthand Collection in the New York Public Library, New York Public Library, 1935, p. vii.

DEFINITION OF TERMS

Standard Gregg Shorthand means subject content in the Gregg Shorthand Simplified textbook, Edition of 1949.

Variation from Standard Gregg Shorthand Simplified means any change in a graphic symbol making it different from the Standard Gregg Shorthand Simplified graphic symbol for the same word.

Plate shorthand is a term used to describe the written shorthand graphic symbols that appear in the text illustrations of Gregg Shorthand Simplified.

HYPOTHESIS

Gregg Shorthand Simplified, as it was taught, served its purpose. Although certain key elements may not have been followed accurately, shorthand writers, except for some slight carelessness and accidents, did write during employment a shorthand that was close to plate shorthand.

Examples of certain variations from plate Gregg Shorthand Simplified as used during employment occur particularly in the following categories: use of left and right "s," confusion of "o" and "oo," circle vowels ("a" or "e") in relation to straight strokes, use of "-ings," "-ith" joining and its misuse, representation of the word ending "-ther," past tense "-ed," "-ded," and "-t," and treatment of amounts and quantities.

These variations may take several forms, such as substitution of right "s" for the intended left "s," placement of a circle vowel between curves in a way different from the Gregg rule, or confusion of "o" shorthand symbol for the intended "oo" symbol.

ASSUMPTIONS

It was assumed that the Gregg Shorthand Simplified written in the samples is the shorthand that was taught according to the text when the writers were taught.

Since samples of Gregg Shorthand Simplified notes are taken at random from the daily work of writers, these samples are representative of the Gregg Shorthand Simplified in common usage by these writers.

Gregg theory principles and procedures have been reasonably learned because two years of instruction is a reasonable learning period, and the variations written are modifications made by the shorthand writers.

RELATED LITERATURE

A search for literature which might be related by nature of subject matter, technique used, parallelism, or pertinence to the stated topic of variations from Gregg Shorthand, was made in scholarly books; publications of the government, learned societies, and other organizations; periodicals; essays; encyclopedia articles; unpublished materials like dissertations; and newspapers. Critical appraisals of

possible deviations and of topics parallel or tangential were sought in literature to illuminate this project. As the search progressed and additional materials were disclosed, they were subsumed.

The search for related literature led to Jacob Grimm's Law regarding changes or permutations in consonant sounds and the regularity of correspondence of sounds in genetically related languages, Webster's Third New International Dictionary for the "rightness" of English in standard or common usage, Esperanto, linguistics investigations by the Bell Telephone Laboratories, the Initial Teaching Alphabet experiments, and modern pronunciation of the ancient Hebrew language.

Standard sources and every effort to find related works revealed nothing that was closely related to this study. This work is the first of its kind.

PROCEDURES OF COLLECTION AND PREPARATION OF THE DATA

Delimitations. Written samples were collected only from people who had studied Gregg Shorthand Simplified to determine if variations were the same or different among geographical areas. Samples of shorthand already written were sought only in a natural context, i.e., on the job from notebooks used everyday in order to obtain the shorthand as written in common usage. The study was made only of the shorthand of

writers who had at least two years of instruction, or the equivalent, to provide a uniform, minimum preparation.

Primary sources. Primary sources were used as follows: The shorthand written in the samples was classified as a primary source. The Gregg Shorthand Simplified text, 1949; the Gregg Shorthand Simplified Dictionary, 1949; and Phrases of Gregg Shorthand Simplified, 1949, used to transcribe the outlines and identify variations, were also primary sources.

Adequacy of samples. Adequacy of samples was established by the procedure of collecting samples until no new variations appeared, and the last 100 words made no difference, fulfilling purposes of the project. Altogether, 285 samples having an estimated 166,725 outlines representing 203,205 words were collected and transcribed. Some samples had to be discarded because the amount of shorthand was inadequate for three pages, was substantially illegible, had a large amount of longhand in lieu of shorthand, or was unusuable for some other reason. Ultimately, 212 samples were retained as satisfactory for purposes of the study, and had 133,380 outlines representing 162,544 words.

Procedures.

1. Collect samples of Simplified Shorthand written previously during employment.

a. Preview group of samples. The first 25 samples collected were set aside and studied as a

preview of variations to determine how many variations might be located, their characteristics, why they seemed to occur, and in general, what might be expected in the main body of samples.

b. Main body group of samples. A collection of the largest number of samples was organized by dividing the country into five geographic areas: East or local, Far West, Midwest, South, and Southeast. This was planned to supply a large source of national data for the study. A secondary purpose was to determine, by comparison of local samples with samples from other national areas, if the number of variations from Gregg Shorthand Simplified was reasonably the same nationally as locally; and if not, why.

c. Review group of samples. In order to determine if speed were a factor in the number of variations, 25 samples were dictated at 60 to 120 words a minute to shorthand writers during employment. A secondary purpose was to increase the total number of words studied and, thus, to improve adequacy of samples.

2. Determine kinds of variations important to Simplified theory, identify variations by kind using the nine categories previously listed on page 2, record,

organize the variations, and cross reference each to its original case for ready reference. Shorthand experts (see page 16) will judge if kinds of variations are important and if variations are located accurately and completely.

3. Compute totals and summarize variations as preparation for analysis and interpretation.

Collection of data. The collection of data began in local offices. The investigator went with no previous appointment into areas where there was a concentration of offices such as banks, insurance, and accounting firms. Since it was necessary to obtain only Simplified Gregg Shorthand studied in the 1949 Edition, the investigator asked, "Are there any secretaries or stenographers in this office under thirty years of age who use Gregg Shorthand daily and have had at least two years of instruction or the equivalent in business schools or colleges? May I have three pages of their notes written at a previous time?"

In some of the cases, the receptionist was a secretary; and if there were other secretaries or stenographers in the office, the receptionist called them to come to the desk with their notebooks. They tore three pages at random from their everyday notebooks while the investigator watched. In all the remaining cases, they went back to an inner office to get their notebooks; were gone only a very few moments, not longer than the time needed to tear pages; and returned with

the samples. It was reasonable to regard the samples as previously written.

The shorthand writers were asked if they had studied Simplified Gregg Shorthand, and if so, to write at the top of the first page the date of their graduation from high school, the number of years shorthand was studied--at least two were required--or the equivalent in business school or college, and the name of the text. The investigator stressed complete anonymity. No individual or firm names were desired. In fact, shorthand writers were urged to block out, cut out, or otherwise delete names and identification of all persons from the samples. This seemed to reassure hesitant shorthand writers about giving notes.

The wide range of types of firms and the broad scope of vocabulary words are shown by some of the contents of the samples, listed in part as follows:

Nitrogen fertilizer sales, Boy Scout Eagle Court of Honor, ammonia manufacturing problems, World Series ticket purchase, Bahama Star leaving Miami, psychological testing report of phenomenological experiences of headaches in insanity, transfer of 500,000 shares of stocks and bonds, alfalfa dehydration processes, proposed visit of the Geophysics Society to Russia and their report on petroleum, sale of a horse, Greek royal wedding, police report of auto accident, greenhouse tour, market research, advertising research,

engineering consultation, radio journal, publishing, architects' contracts, legal affidavits, and others.

The collection of data was expanded to national areas by mail with the aid of the Administrative Management Society, formerly the National Office Management Association, which had members throughout the United States. A request was sent to the president for names and addresses of members who would be willing to send 30 samples of three pages each of Gregg Shorthand Simplified notes written by secretaries or stenographers.

The permanent address of the Society appears as follows:

Executive Director Secretary
National Office
Administrative Management Society
Willow Grove, Pennsylvania

A copy of the letter which was sent to each AMS member described the study briefly and showed how the findings might benefit the reader by improving business communication. A return envelope with stamp was enclosed for mailing of samples to investigator. An enclosure detailed as follows the requirements of the shorthand samples and of the writers of shorthand for the samples to be selected:

1. Any three consecutive pages of Gregg Shorthand Simplified notes, written previously on any one day, and recently, within the past two months.

2. The pages to be taken from notebooks used in

everyday dictation and to have a content of any general business correspondence such as is ordinarily found in dictated letters during the regular work of the secretary or stenographer.

3. No identification of individual or firm to ensure anonymity.

4. On the first page, the year of graduation from high school, the number of years of shorthand studied (a minimum of two or the equivalent in private business or college), and the name of the text (Simplified was required as the older Anniversary or the 1963 Diamond Jubilee texts were intended as subjects of this study).

The follow-up letter restated points of the first letter, enclosed a sheet of details of the samples, and asked for an early reply.

When national samples were received, they were completely anonymous as to shorthand writer and business firm. Also, respondents had the option of refusing to send samples previously written, and it is reasonable to believe there was no incentive or motivation for them to bother going to the trouble of dictating special material. Moreover, local and national findings were mutually supporting.

It required about six to eight months to obtain the national samples which finally accumulated to 135, but some had to be discarded for reasons listed on page 9.

Method for calculating the number of outlines, words represented, and lines of writing. Samples of shorthand had three pages. Only the writing on one side of each page was studied. The total number of outlines and words represented were found by estimation, a recognized method used by scholars such as Irving Lorge in The Semantic Count of the 570 Commonest English Words.[1] Three representative samples of small, medium, and large size shorthand writings were studied for the number of outlines for six consecutive lines each, then averaged to find the average number of outlines per line, 7.8, correct to the nearest tenth.

The same method was followed to determine the average number of words per line, calculating the number of words represented by shorthand outlines for six consecutive lines of writing for each of three samples, as above, then averaging to find the number of words per line of writing, 9.5, correct to the nearest tenth.

Total lines of writing per sample were found by determining the number of lines per page, 25, and multiplying by three pages. Then, the total lines per sample, 75, were multiplied by the number of outlines per line, 7.8, to find 585 outlines per sample, and by the number of words per line, 9.5, to find 712.5 or 713 words per sample, rounded

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[1]Irving Lorge, The Semantic Count of the 570 Commonest English Words (New York: Bureau of Publications, Teachers College, Columbia University, 1949), p. vi.

to the nearest whole number.

A distribution of samples is shown in Table I on page 17.

Review group of samples. Although larger quantities of shorthand outlines were involved in the review group of samples because of the need to dictate at varying speeds of 60, 80, 100, and 120 words a minute, the variations were comparable, however, since the comparison was based on the number of variations per 1,000 words.

The review samples were obtained in the following manner: subject matter commonly used in business letters was taken from representative letters in The Business Teacher[1] for each dictation speed at 60, 80, 100, and 120 words a minute, and dictated by the investigator to 25 employed secretaries in their different offices during business hours. A few minutes warmup practice was given. Delimitations on population and data were the same as those for all other samples and may be found on page 8. The purpose of this dictation was to determine if speed were a factor in the variations.

Shorthand experts. Goode and Hatt state, in part, that

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[1]The Business Teacher, Vol. 42, no. 3, January-February, 1965, pp. 26, 27. In the first letter, the words "bent and" were inserted near the end of the first paragraph after "keys." In the letter to Mr. Harper, "$1 up" were added at the end of the first paragraph. In the second paragraph of the same letter, "-ings" was added to the fourth word.

TABLE I

SUMMARY OF DISTRIBUTION OF SAMPLES OF GREGG SHORTHAND SIMPLIFIED OUTLINES[a] AND WORDS[b] REPRESENTED

Number of Samples of 3 Pages Each			Number of Outlines			Number of Words Represented by Outlines		
Preview								
Local		25			14,625			17,825
Main Body								
Local		62			36,270			44,206
National, excluding Local								
Far West	25		14,625			17,825		
Midwest	25		14,625			17,825		
South	25		14,625			17,825		
Southeast	25	100	14,625	58,500	94,770	17,825	71,300	115,506
Review								
Local		25[c]			23,985			29,213
TOTALS		212[d]			133,380			162,544
Lines of Writing[e]		17,100						

[a]Total average shorthand outlines per sample are 585.

[b]Total average words, represented by outlines, per sample, three pages each, are 713, correct to nearest whole number.

[c]These samples have a larger number of outlines and words because more dictation material was required for varying speeds. Variations are comparable, however, because comparisons will be based on the number of variations per 1,000 words.

[d]Not including seventy-three additional samples having approximately 42,000 outlines and 52,000 words, transcribed and discarded because of excessive longhand or illegible shorthand.

[e]Lines of writing average seventy-five for three pages of each sample.

jury opinion is an extension of the method of logical validation; and confirmation may be obtained from a group of persons who would be considered expert in the field.[1]

The shorthand experts brought qualifications for expertness including a professor teaching Simplified Shorthand in a teachers college and at the same time, serving as editor of a national journal of business education which published numerous articles on Simplified Shorthand, lecturers and writers of college and secondary texts, a member of the New York State Education Department reviewing shorthand examinations for more than 20 years, university teachers, and chairmen of secondary departments of business education, each of whom had extensive and successful experience teaching Simplified Shorthand.

The nine shorthand experts worked individually in three different groups for this study, some serving in two of the groups: Group I: Five experts who approved the list of kinds of variations as important to Simplified theory. Group II: Six experts who sampled the raw data and agreed that the variations were located accurately and completely. Group III: Three outstandingly well-qualified experts who reached agreement without difficulty on the investigator's interpretations of the data.

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[1]William J. Goode and Paul K. Hatt, Methods in Social Research (New York: McGraw-Hill Book Company, 1952), p. 237.

The kinds of variations are shown in Table II on page 20. It was assumed that two years of instruction in Gregg Shorthand Simplified theory principles and procedures were a reasonable time for learning. It was also reasonable to assume that the rules and procedures were learned in that time and that variations from these rules and procedures were modifications made by the shorthand writers.

Gregg theory principles and procedures pertaining to kinds of variations may be found on the following pages:

(1) Use of left and right "s": pp. 76, 77, 157, and 219. (2) Confusion of "o" and "oo": pp. 29, 58, 68, 172, 173, and 178. (3) Circle vowels ("a" or "e") written between opposite curves: p. 28. (4) Circle vowels ("a" or "e") written in relation to straight structures: p. 28. (5) Use of word ending "-ings": p. 230. (6) Use of word joining "-ith": pp. 29 and 77. (7) Representation of the word ending "-ther": p. 62. (8) Past tense endings of "-t," "-ed," and "-ded": pp. 38 and 148. (9) Treatment of amounts and quantities: p. 210.

Identification. The group of variations was agreed upon, after complete transcription, by checking with the Gregg dictionary, phrase book, and text; with a guide made by copying pertinent text rules; and by listing illustrations of outlines difficult to remember. Each variation in the shorthand outlines was circled in red and labeled with the number

TABLE II

KINDS OF VARIATIONS FROM GREGG SHORTHAND SIMPLIFIED RULES AND PROCEDURES

1.	Use of left and right "s"
2.	Confusion of "o" and "oo"
3.	Circle vowels ("a" or "e") between opposite curves
4.	Circle vowels ("a" or "e") in relation to straight structures
5.	Use of "-ings"
6.	"-ith" joining and its misuse
7.	Representation of the word ending "-ther"
8.	Past tense "-ed," "-ded," and "-t"
9.	Treatment of amounts and quantities

of the category that pertained. A sample of the actual work of identifying variations was shown.

The five shorthand experts individually sampled the raw data and reached agreement without difficulty that the variations were being located accurately and completely. This was a check of the actual work the investigator had done.

Forms of the variations. (1) Use of left and right "s." Right and left "s" were interchanged incorrectly according to the Gregg text rule. (2) "o" for "oo" intended, and "oo" for "o" intended. "o" and "oo" were interchanged incorrectly according to the Gregg text rule. (3) Circle vowels ("a" and "e") between opposite curves. The circle was written inside, instead of on the back of, the first curve. (4) Circle vowels ("a" and "e") in relation to straight structures. The circle was written incorrectly inside the angle and counterclockwise. (5) Word ending "-ings." The outline "s" for "-ings" was written incorrectly with a right motion. (6) Word ending "-ith." The over and under "-ith" outlines were interchanged incorrectly according to the Gregg text rule. (7) Treatment of amounts and quantities. Amounts of dollars and cents were written as they are regularly in longhand and not in shorthand according to the Gregg text rules.

Recording the variations. The variations were then recorded by kind and geographic group in an orderly, logical fashion, identified by the number of their samples and cross referenced to the original case for future use.

Reproductions in India ink were made on 112 pages showing minutely the shorthand outlines with variations for 162,544 words studied. See Table III on page 23. Cases of variations were totaled for each of the groups of samples to prepare for summaries and interpretations.

A general summary of variations in shorthand outlines, showing the number of cases for each group of samples, may be found in Table IV on page 24.

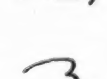
ANALYSIS OF THE DATA

The method of estimating cases. Ten letters containing common business letter material were selected at random from 30 issues of the magazine, The Business Teacher. The standard procedure of using a table of random numbers was followed, such as that found in any text on statistical research like Methods of Social Research by Goode and Hatt, page 217. One hundred words from the body of each of the ten letters were taken for a total of 1,000 words and written in Gregg Shorthand Simplified outlines. All cases of each kind of shorthand outline being studied were identified and totaled. It was found that 1,000 words proved adequate, providing cases of all outlines studied; and the last 100 words made no difference.

The remaining steps are given as an illustration and were taken for each kind of variation and for all groupings of samples:

TABLE III

VARIATIONS IN THE USE OF LEFT AND RIGHT "S"
IN OUTLINES* OF PREVIEW SAMPLES
#1-25, REPRESENTING
17,825 WORDS

Left "s"			Right "s"		
Sample			Sample		
#2		ideas	#3		of (4)**
3		returns	5		decision
		bonds	9		superior
		rates	19		as a result
		dates			excess
		September	24		sincere
8		must have			
10		laboratories			
13		excursion			
14		concerning			

*Outlines are reproduced as nearly like originals as possible, including all errors made by original writers. Only variations as written are studied. Omitted portions of outlines lie beyond the purpose and scope of this investigation.

**Numbers in parentheses following the words indicate the frequency of occurrence.

TABLE IV

SUMMARY OF VARIATIONS

	Preview	Far West	Mid-West	South	South-east	National excluding Local Total	Local	Main Body Local and National Total	Review	Preview, Main Body, and Review Total	Final Sums
Samples	25	25	25	25	25	100	62	162	25	212	
Outlines	14,625	14,625	14,625	14,625	14,625	58,500	36,270	94,770	23,985	133,380	
Words	17,825	17,825	17,825	17,825	17,825	71,300	44,206	115,506	29,213	162,544	
Left "s"	10	13	15	11	8	47	50	97	44	151	
Right "s"	9	10	5	7	6	28	17	45	31	86	237
"o" for "oo"	18	15	14	24	26	79	56	145	45	198	
"oo" for "o"	17	11	4	10	11	36	40	76	44	137	335
"a" between opposite curves	2	2	1	0	2	5	1	6	1	9	
"e" between opposite curves	0	3	1	6	2	12	26	38	3	41	50
"a" and straight structures	1	9	3	5	1	18	15	33	29	63	
"e" and straight structures	1	6	2	2	3	13	17	30	16	47	110
"-ings" use	0	5	4	5	2	16	7	23	2	25	
"-ith" use	1	1	0	1	1	3	11	14	1	16	46
"-ther" use	1	0	0	2	1	3	0	3	1	5	
"-ed" past tense	57	120	77	85	72	359	176	535	84	680	
"-ded" past tense	3	12	3	5	16	36	14	50	2	55	737
"-t" past tense	0	0	0	0	0	0	1	1	1	2	
Past Tense Totals	60	141	80	90	88	395	191	586	87	737	
Amounts and quantities	51	40	27	46	40	153	98	251	22	324	324

TABLE V

REVIEW VARIATIONS FOR DICTATION SPEEDS OF
60, 80, 100, 120 WORDS A MINUTE

Category	Words a Minute 60	80	100	120[f]	Total
Left "s" intended	4	13	13	43	73
Right "s" intended	9	4	4	15	32
Total	(13)	(17)	(17)	(58)	(105)
"o" for "oo" intended	12	7	16	45	80
"oo" for "o" intended	9	14	10	11	44
Total	(21)	(21)	(26)	(56)	(124)
"a" between opposite curves	0	0	0	1	1
"e" between opposite curves	1	2	0	0	3
Total	(1)	(2)	(0)	(1)	(4)
"a" in relation to straight strokes	7	6	11	5	29
"e" in relation to straight strokes	4	6	2	4	16
Total	(11)	(12)	(13)	(9)	(45)
"-ings" use	-[a]	2	-	-	2
"-ith" use	1[b]	0	0	0	1
"-ther" use	1[c]	-	-	-	1
"-ed" past tense	51	0[d]	23	10	84
"-ded" past tense	2[b]	-	-	-	2
"-t" past tense	-	1[a]	-	-	1
Past tense total	(53)	(1[e])	(23)	(10)	(87)
Amounts	-	2	-	22	84

The items referred to in footnotes occurred only in the dictation material at the following speeds:

[a]80 Wam. [b]60 Wam. [c]60 and 80 Wam.

[d]80 Wam. "Enclosed" was the only word in the past tense dictated at this speed.

[e]80 and 120 Wam.

[f]25 shorthand writers wrote at the other speeds but only 22 consented to write at this highest speed of 120 words a minute.

1. In the shorthand outlines of 1,000 words, there occurred 130 left "s's." Dividing 130 by 1,000 gave a ratio of .130.

2. This ratio of .130 when multiplied by all the words in any grouping, e.g., 162,544, gave estimated total left "s's" of 21,130.72.

3. The number of variations of left "s" written on the job, 151, was compared with the estimated total left "s's," 21,130.72, deriving by division, an index of variations of .0071 for interpretation.

The preceding method of analysis was described in its entirety for the sake of clarity.

Data for ratios may be found in Table VI on page 27, and for estimates in Table VII on page 28. Complete data were prepared for all other groupings. Indexes of variations appear in Table VIII on page 37.

The data regarding variations in the review samples were better interpreted from the figures for variations because of the different dictation rates; and, therefore, the figures appear without further computation in the section of summaries, page 30.

Interpretation of indexes of variations. The indexes of variations provided a reasonably accurate and convenient method of interpreting the importance of frequencies of

TABLE VI

RATIOS OF POSSIBLE OCCURRENCES STUDIED TO 1,000 TYPICAL WORDS ARRANGED IN ORDER FOR NINE KINDS OF VARIATIONS

Category	Possible Occurrences	Divided by 1,000 Typical Words	=	Ratio
Left "s" intended	130			.130
Right "s" intended	102			.102
1. Total "s"	(232)			(.232)
"o" for "oo" intended	129			.129
"oo" for "o" intended	126			.126
2. Total "o" & "oo"	(255)			(.255)
"a" between opposite curves	1			.001
"e" between opposite curves	8			.008
3. Total "a" "e" C	(9)			(.009)
"a" and straight strokes	57			.057
"e" and straight strokes	69			.069
4. Total "a" "e" S	(126)			(.126)
5. "-ings"	2			.002
6. "-ith"	12			.012
7. "-ther"	14			.014
"-ed" past tense	18			.018
"-ded" past tense	1			.001
"-t" past tense	3			.003
8. Total past tense	(22)			(.022)
9. Treatment of amounts and quantities	12			.012

TABLE VII

ESTIMATED TOTAL POSSIBLE CASES IN NINE KINDS OF VARIATIONS FOR ALL THE SAMPLES

Category	Ratio	X 162,544 Words =	Estimated Cases[a]
Left "s" intended	.130		21,130.72
Rights "s" intended	.102		16,579.49
1. Total "s"	(.232)		(37,710.21)
"o" for "oo" intended	.129		20,978.18
"oo" for "o" intended	.126		20,480.54
2. Total "o" & "oo"	(.255)		(41,458.72)
"a" } between opposite curves	.001		162.54
"e" } between opposite curves	.008		1,300.35
3. Total "a" "e" C	(.009)		(1,462.89)
"a" } and straight strokes	.057		9,265.01
"e" } and straight strokes	.069		11,115.54
4. Total "a" "e" S	(.126)		(20,380.55)
5. "-ings"	.002		325.09
6. "-ith"	.012		1,950.53
7. "-ther"	.014		2,275.62
"-ed" } past tense	.018		2,925.79
"-ded" } past tense	.001		162.54
"-t" } past tense	.003		487.63
8. Total "-ed" and "-ded"	(.022)		(3,579.97)
9. Treatment of amounts and quantities	.012		1,950.53

[a]Figures are correct to the nearest hundredth.

variations in 162,544 words to Gregg theory principles and procedures. No specific index was designated as a definitive point of significance for diminishing returns because further research will have to determine what number of cases of variations is the standard for minimum importance to Gregg theory principles and procedures.

The jury for this section consisted of university and secondary education shorthand experts who were also authors of college and secondary texts, other professional books, and articles, and were widely recognized as lecturers and writers in their fields. See page 16.

The reader is reminded that "index of variations" means the decimal obtained by dividing the actual variations in shorthand outlines of this study by the estimated total possible cases.

A word of caution is presented about assuming any results as representative of standards beyond the scope of this study. For example, this study does not propose to determine "expected variations." Estimated cases are different; they are the total possible occurrences of each kind of variation, e.g., left "s," studied in 162,544 words of this investigation. It is an extremely remote probability that 100 per cent of the estimated total possible cases of occurrence of left "s" would be written incorrectly as variations --occurrences of left "s" are different from variations among occurrences; therefore, "estimated cases of occurrence of

left "s" are not to be confused with an unknown "expected variations"; and in no part of this study are the terms interchangeable.

Further research will have to determine what number of variations may be "expected" and what number would be standard for minimum significance to Gregg Shorthand theory principles and procedures. No unrelated factors are to be construed from the data.

SUMMARY OF FINDINGS, INTERPRETATIONS, AND CONCLUSIONS

The jury reached agreement without difficulty on the following interpretations of the data. See Table VIII on page 37 for findings.

1. Past tense "-ded." Variations were found to be 55 out of an estimated total possible cases of 162.54, giving an index of .3384, or 33 cases out of 100. Interpretation. Variations were judged as too high a frequency for accident or carelessness and showed that the text outline for "-ded" was modified by joinings in the typical shorthand written during employment. Conclusion. The Simplified rule has not served its purpose and the advisability of teaching the rule is doubtful. The Diamond Jubilee System has met this need by joining the last sound heard.

2. Past tense "-ed." Variations numbering 680 occurred out of a possible 2,925.75, producing an index of .2325 or 23 cases out of 100. Interpretation. This frequency was higher

than could be explained by chance. It was judged that typical shorthand writers were not using text shorthand for past tense "-ed" on the job in an important number of cases and that the shorthand written was modified from text theory. Conclusion. The Simplified principle should be critically examined for modification. The Diamond Jubilee revision of always joining the last sound heard was justified by the evidence of the findings of this study.

3. Treatment of amounts and quantities. An index of .1661 cases out of 100 was found for 324 actual variations occurring in 1,950.53 possible cases. Interpretation. Sixteen cases were higher than could be accounted for by carelessness or accident and showed that standard shorthand was not used consistently for amounts and quantities on the job. Conclusion. The Simplified principle needs to be critically examined for modification. Diamond Jubilee revisions in writing fully cents and abbreviations, such as bushels, were justified by the evidence of findings of this study.

4. "-ings" ending. It was found that 25 variations were written out of a possible 325.09, producing an index of .0769, or seven out of 100 cases. Interpretation. It was judged that plate shorthand was not remembered or used by these shorthand writers during employment. Conclusion. The Simplified rule for "-ings" was not serving its purpose.

5. "a" between opposite curves. Nine variations were found written on the job out of a possible 162.54, producing

an index of .0554, a minimum frequency for importance. Interpretation. It was judged that five cases out of 100 were reasonably enough to indicate that the text rule was not serving its purpose to this extent, and that these shorthand writers were not using the rule in their writing. Conclusion. The Simplified rule is not remembered or used to the extent of five out of 100 times.

6. "e" between opposite curves. There were three cases of variations out of 100, an index of .0315, derived from 41 variations out of a 1,300.35 possible cases. Interpretation. The cases were so few that they could have been caused by accident or carelessness. It was judged that typical shorthand writers were reasonably accurate in writing plate shorthand for this kind of variation. Conclusion. This Simplified rule is used in most cases during employment.

7. "o" for "oo" intended. Estimated total possible cases were 20,978.18, actual variations were 198, and the index was .0094 showing that not even one case out of 100 was found. Interpretation. It was judged that the few variations occurring were made by accident or carelessness and that standard shorthand writing was used typically on the job. Conclusion. This Simplified principle is learned and used on the job.

8. "-ith" ending. An index of .0081 was found for 16 actual variations out of 1,950.53 possible cases. The variations were negligible. Interpretation. Since not even one

case out of 100 was found, occurrence of these few variations could be explained by chance or carelessness; and it was judged that typical shorthand learning was satisfactory, and typical shorthand writers were accurate in writing plate shorthand on the job. Conclusion. This Simplified principle was written accurately, for the most part.

9. Left "s" intended. Variations of 151 out of 21,130.72 possible cases yielded an index of .0071. Interpretation. The occurrence was so low that it was judged that shorthand learning was satisfactory, and Simplified writers were reasonably accurate in writing plate shorthand during employment. Conclusion. The text rule for left "s" served its purpose.

10. Circle vowel "a" in relation to straight strokes. An index of variations of .0068 was derived from 63 actual variations out of 9,265.01, showing less than one variation out of 100 possible cases. Interpretation. The small numbers of variations indicated that they could have been caused by carelessness or accident and that shorthand written on the job was judged, from the evidence of the variations, as reflecting satisfactory learning. Conclusion. Simplified theory served its purpose.

11. "oo" for "o" intended. Only 137 variations occurred in 20,470.54 possible cases. Interpretation. The index of .0067 revealed that the typical shorthand written on the job had very few errors and was commonly written during

employment in accordance with text theory. Conclusion. Simplified theory was used satisfactorily on the job.

12. Right "s" intended. An index of .0052 was obtained from 86 variations out of 16,579.49 possible cases. Interpretation. It was judged that typical shorthand written on the job was not modified often enough to be important, and the few variations could have been caused by accident or carelessness. Conclusion. Typical shorthand was written reasonably accurately during employment.

13. "e" and straight strokes. Only 47 variations out of 11,115.54 possible cases gave a small index of .0042, meaning that not even one variation out of 100 occurred. Interpretation. This frequency is so small that the judgment was made that standard shorthand was learned and used during employment for this kind of variation. Conclusion. Simplified theory was not modified often enough for the modification to be important.

14. Past tense "-t." Two variations occurred for 487.63 possible cases giving an index of .0041. Interpretation. Simplified writers were reasonably accurate in writing plate shorthand. Conclusion. Simplified theory served its purpose.

15. "-ther" ending. Two variations occurred for 487.63 possible cases giving an index of .0041. Interpretation. Standard shorthand was used during employment. Conclusion. Text theory was followed reasonably accurately

and served its purpose.

A summary of total computations for the nine kinds of variations will be found in Table VIII on page 37, and interpretations and conclusions appear as follows:

1. Total past tense "-ded," "-ed," "-t." There were 20 variations written out of 100 possible cases. Interpretation. Modifications were written in a high number of cases during employment. Conclusion. Simplified principles and procedures were not serving their purposes. Diamond Jubilee revisions have met this need by joining the last sound heard.

2. Total for treatment of amounts and quantities. There were 16 variations out of a possible 100. Interpretation. Shorthand writers did not remember to use this principle on the job a significant number of times in daily writing. Conclusion. Simplified theory did not serve its purpose. The Diamond Jubilee System met this need to the extent that it revised the Simplified rule.

3. Total "-ings" word ending. There were seven variations in 100 possible cases. Interpretation. There were more variations than could positively be accounted for reasonably by accident or carelessness. Conclusion. The Simplified rule was not serving its purpose.

4. Total circle vowels ("a" or "e") between opposite curves. Only three variations out of 100 occurred. Interpretation. Standard shorthand was used, for the most part,

on the job. Conclusion. Gregg Simplified theory was used and served its purpose.

5. Total for confusion of "o" and "oo." Less than one variation, .8, was written in 100 possible times. Interpretation. Such a low occurrence meant that text shorthand was used mainly in everyday writing. Conclusion. This Gregg principle was used almost all the time on the job.

6. Total "-ith" joining. Only .8 of one variation occurred in 100 possible cases. Interpretation. It was judged that shorthand theory learning was satisfactorily used on the job. Conclusion. Simplified theory served its purpose.

7. Total left and right "s." Just .6 of a variation was written in 100 cases. Interpretation. Shorthand writers used typical text shorthand on the job. Conclusion. Simplified theory was learned and written during employment.

8. Total circle vowels ("a" or "e") in relation to straight strokes. Only .5 of a variation occurred in 100 times. Interpretation. Text shorthand was written accurately, for the most part, on the job. Conclusion. Simplified theory served its purpose for this kind of shorthand outline.

9. Total "other" ending. The lowest frequency of .2 for 100 estimated cases occurred here. Interpretation. These few variations could easily have been caused by accident or carelessness. Conclusion. Standard shorthand was

TABLE VIII

INDEXES OF VARIATIONS FOR ALL THE SAMPLES WITH 162,544 WORDS

Category	Estimated Total Cases	Divided into	Actual = Variations	Indexes[a]
Past tense "-ded"	162.54		55	.3384
Past tense "-ed"	2,925.79		680	.2322
Treatment of amounts and quantities	1,950.53		324	.1661
"-ings" ending	325.09		25	.0769
"a" between opposite curves	162.54		9	.0554
"e" between opposite curves	1,300.35		41	.0315
"o" for "oo intended	20,978.18		198	.0094
"-ith" joining	1,950.53		16	.0082
Left "s" intended	21,130.72		151	.0071
"a" and straight strokes	9,265.01		63	.0068
"oo" for "o" intended	20,470.54		137	.0067
Right "s" intended	16,579.49		86	.0052
"e" and straight strokes	11,115.54		47	.0042
"-t" past tense	487.63		2	.0041
"-ther" ending	2,275.62		5	.0022
INDEXES SHOWN BY TOTALS FOR NINE KINDS OF VARIATIONS				
Past tense "-ded," "-ed," "-t"	3,579.97		737	.2059
Treatment of amounts & quantities	1,950.53		324	.1661
"-ings" ending	325.09		25	.0769
"a" "e" opposite curves	1,462.89		50	.0342
Confusion of "o" and "oo"	41,448.72		335	.0088
"-ith" joining	1,950.53		16	.0082
Left and right "s"	37,710.21		237	.0063
"a" "e" straight strokes	20,380.55		110	.0054
"-ther" ending	2,275.62		5	.0022

[a]These figures are correct to the nearest ten thousandth.

used on the job for the most part.

SUMMARY OF THE COMPARISON OF VARIATIONS FOR LOCAL AND NATIONAL SAMPLES

Table IV on page 24, columns 2 through 7, shows the variations for 115,506 words in local and national groups and for individual national groups. Averages were computed per sample from those variations and were found to be as follows:

	Local	National	Far West	Mid-west	South	South-east
Total Variations	529	808	247	156	209	191
Number of Samples	62	100	25	25	25	25
Average	8.5	8.1	9.9	6.2	8.3	7.6

To compare the groups on an equal basis since they had a differing number of samples, an average was found for each group by dividing the number of variations by the number of samples.

It was readily observed that 8.5, the average for local samples, was similar to 8.1, the average for national samples. Although averages for individual groupings ranged from 6.2 for Midwest to 9.9 for Far West, and although it could be said that individually these areas had fewer and more variations respectively than the local area, the average of 8.1 for all four areas based on 115,506 words, was a truer measure. Finding. The local average of variations per

sample was 8.5, and national was 8.1. Interpretation. The difference of .4 was so low as to be negligible. Conclusion. Simplified theory is written with very little difference by shorthand writers during employment throughout the country.

SUMMARY OF VARIATIONS IN REVIEW SAMPLES

The purpose of studying variations made in different dictation rates in 29,213 words was to determine if speed were a factor in the occurrence of variations. See Table V on page 25. Although 25 shorthand writers took dictation at rates from 60 to 100 words a minute, only 22 consented to write at the highest speed of 120 words a minute. Thus, variations for 120 words a minute would probably have been higher if these writers had taken dictation at this rate; but the following figures show that the probable increase would not have been enough to change the resulting relationship interpretation.

Averages were computed per one minute of dictation for variations from standard Gregg Shorthand Simplified at each of the dictation rates, correct to the nearest tenth, as follows:

Words a minute	60	80	100	120
Average per minute of dictation	1.7	.7	.8	1.3

When total variations at each of the dictation rates were divided by the respective minutes per rate, it could be readily observed from the resulting averages of variations

per minute of dictation that the average for 120 words a minute was reasonably similar to the average for 60 words a minute, actually .4 less. Findings. Averages per minute of dictation for variations were computed as follows: 1.7 - 60, .7 - 80, .8 - 100, and 1.3 - 120 words a minute. Interpretation. Since variation averages per minute decreased as the speed increased, it appeared that there was not much difference in the averages per minute. Conclusion. Speed did not appear to be a decisive factor in the number of variations made per minute as dictation rates increased from 60 to 120 words a minute.

SUMMARY OF A COMPARISON OF VARIATIONS FOR PREVIEW AND MAIN BODY SAMPLES

The purpose of a comparison of variations for preview and main body samples was to determine if the first 25 samples collected, which contained 17,825 words, would reasonably predict the number of variations that would occur in the main body of 115,506 words. Table IV on page 24, columns 1 and 8, show the variations. Averages were computed per word and are shown as follows:

	Preview	Main Body
Total variations	171	1,337
Number of words	17,825	115,506
Average per word	.0096	.0117

To compare the groups on an equal basis since they had a different number of words, an average was found for each

group by dividing the number of variations by the number of words. The resulting averages were then comparable. Averages were found to be .0096 for preview and .0117 for main body samples. Interpretation. The difference of .0021 was such a low amount that there was consistency in the number of variations for the two groups. Conclusion. The variations in both groups were so nearly the same that it is reasonable to say that the first 25 samples collected, called the preview, reasonably predicted the number of variations that occurred in the samples collected later, called the main body group.

SUMMARY OF A COMPARISON OF VARIATIONS FOR MAIN BODY AND REVIEW SAMPLES

The purpose of a comparison of variations for main body and review samples was to determine if there would be a reasonable similarity between the number of variations occurring in the review samples of 29,213 words and the number of variations in the main body of 115,506 words. Table IV on page 24, columns 8 and 9, shows variations for these two groups.

Averages were computed per word of shorthand written and are shown as follows:

	Main Body	Review
Number of variations	1,337	326
Number of words	115,506	29,213
Average per word	.0117	.0112

The number of samples could not be used in this

computation because, although the review group had 25 samples, each of these samples had more words due to the different speeds of dictation, 60 to 120 words a minute, than each of the main group's samples. A comparable basis was found by dividing variations by the number of words in the group, and the decimal average obtained was then comparable for the two groups. Finding. Averages per word were computed for variations and were found to be .0117 for the main body and .0112 for the review. Interpretation. The difference of .0005 was so low that it was judged that variations were similar for main body and review groups. Conclusion. The variations for both groups were so consistent that it was logical to infer that the last 25 samples collected, called the review group, reasonably repeated the number of variations in the main body.

Validity. This study of Gregg Shorthand Simplified has validity in the extent to which it served its purpose. A valid test has been defined as one that measures what it is supposed to measure.[1] After variations from Gregg theory principles and procedures were identified by the investigator, a jury of shorthand experts sampled the raw data of the shorthand writing and agreed that the variations were located accurately and completely for purposes of the study.

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[1]William J. Goode and Paul K. Hatt, Methods in Social Research (New York: McGraw-Hill Book Company, 1952), 237.

The design of this study of shorthand written during employment is not appropriate for complex statistics. Good and Hatt state, in part, that jury opinion is an extension of the method of logical validation; and confirmation may be obtained from a group of persons who would be considered expert in the field.[1] The committee fulfilled requirements for being considered expert, as explained on 16 and 18; and validity was established.

Consistency. This study has functional statistical consistency, appropriate to the design of the investigation. The size of the sample was adequate, since 133,380 outlines representing 162,544 words were studied until no new variations appeared and the last 100 words made no difference in the results.

Analysis of the data was done by identifying variations, estimating total possible cases, deriving indexes by division, and interpreting these indexes of variations for samples, groupings of samples, and special individual groups of samples.

By using adequate sample size, a similar operational plan, and by deriving indexes of variations, any trained researcher can demonstrate a number of findings.

SUMMARY OF IMPLICATIONS FOR GREGG THEORY

Past tense "-ded" and "-ed." The Gregg Simplified principles and procedures for the past tense forms for "-ded" and "-ed" did not appear to serve their purposes. The advisability of teaching these principles and procedures is doubtful. Diamond Jubilee's revision by adding the last sound heard for the past tense was justified by the findings of this study.

Treatment of amounts and quantities. Simplified theory principles and procedures for treatment of amounts and quantities were not remembered or written in a significant number of words, and did not serve their purposes. It does not seem necessary to teach these rules in their present form. Diamond Jubilee's revisions by writing fully in shorthand certain outlines for amounts and quantities, such as cents, and abbreviations, such as bushels, has met this need in part.

The other two kinds of variations, "-ings" ending and circle vowel "a" between opposite curves, had so high a number of variations that they could not be explained by accident or carelessness. The implication of these high frequencies for Gregg theory principles and procedures was that they were not meeting the needs of shorthand writers on the job and required critical examination for modification.

All the remaining kinds of variations had such low frequencies that Gregg Simplified theory was serving its

purposes and was written satisfactorily, as far as variations were concerned, during employment.

OVERALL CONCLUSIONS

1. A major conclusion of the study was that the Gregg Shorthand Simplified written during employment was essentially text shorthand. Text shorthand was defined as a term used to describe the written shorthand graphic symbols that appear in the text illustrations of Gregg Shorthand Simplified. The shorthand in the samples written during employment contained a low frequency of variations, some of which were key elements in Gregg Shorthand Simplified principles and procedures; but the frequency of such variations was so low that they could be accounted for by carelessness and accidents. The Gregg Shorthand Simplified that was taught to the shorthand writers of the samples, as it was taught, served its purpose. In summary, evidence of the study supported the hypothesis that although certain key elements in Gregg Shorthand Simplified were not followed accurately, shorthand writers, except for slight carelessness and accidents, did write essentially text shorthand during employment. Shorthand, as it was taught, served its purpose.

2. Another conclusion pertained to relationships with the Diamond Jubilee Shorthand System. There were no revisions suggested by the Diamond Jubilee System for the Gregg Shorthand Simplified principles and procedures that were written

correctly. The revisions that were made applied to the needs of shorthand writers as shown by a high frequency of occurrence of variations indicating those needs. In summary, by and large, where the Diamond Jubilee Shorthand System did not revise the Simplified procedures, shorthand writers did use Standard Shorthand during employment. Where evidence of this study showed that shorthand writers did not use Standard Simplified Shorthand, Diamond Jubilee has met this need.

3. The study found a low frequency of variations occurring for certain key elements of Gregg Shorthand Simplified principles and procedures. Some of these variations were marked and may have functioned effectively for those particular shorthand writers during employment; but frequency of these variations was low. In summary, the low frequency of marked variations from Gregg Shorthand Simplified principles and procedures among shorthand writers showed that, although individual cases may have functioned effectively, shorthand writers who were on the job generally used text shorthand.

4. Variations were found among samples of Gregg Shorthand Simplified that were dictated at speeds varying from 60 to 120 words a minute. However, the number of variations made at higher dictation speeds differed only to a negligible extent from the number of variations made at lower dictation speeds; and there was no basis for determining a decisive relationship. In summary, from evidence of this study of Gregg Shorthand Simplified, speed was not a decisive factor

in the number of variations written during employment.

5. The study compared samples of shorthand outlines written on the job throughout the country. Some variations were made by writers in all parts of the country. The frequency of these variations was so slight that Gregg Shorthand Simplified was written with no essential difference by shorthand writers during employment throughout the country.

6. Samples of Gregg Shorthand Simplified were obtained throughout the country. These samples were taken from shorthand writers using the Simplified System in their daily work during employment, showing that the written language of business communication used Gregg Shorthand Simplified in at least one step. Variations from Gregg principles and procedures reflected the particular needs of the shorthand writers making such variations. In summary, the samples of shorthand written throughout the country were, in the opinion of the investigator, evidence that shorthand functioned, at least in one step, as a vital part of the written language of business communication. Shorthand theory was in the process of changing, very much as a written language changes, to meet the needs of shorthand writers.

7. There are implications for general education at all levels for teacher education and for teachers in the field: What is learned stays essentially learned, and it behooves teachers to be aware that many aspects of learning situations will stay learned.

RECOMMENDATIONS

The following recommendations are made for further study:

Devise a Gregg Shorthand system with no choice-making in the writing of any individual shorthand outline, such as left or right "s," over or under "-ith," and "o" and "oo" hook, and test experimentally with a control group to see what the results are. (The everyday business office situation is not appropriate for technical and accurate testing.)

Determine the frequency of cases of sounds per 1,000 words for all kinds of variations from Gregg Shorthand text principles and procedures.

Study the importance of variations from Gregg Shorthand principles and procedures when dictation is given at varying speeds.

Determine what number of cases of variations is the standard for minimum importance to Gregg Shorthand Simplified principles and procedures.

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*Taken from a list of one hundred twenty-five references.

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APPENDIX A

August 5, 1964

Dear (Employer):

A national investigation of shorthand as written on the job, "Variations in Gregg Shorthand," is being undertaken by me at New York University. The findings may make a contribution to more effective office communication by indicating revisions in the theory of shorthand taught to secretaries and stenographers.

Will you help by obtaining thirty samples of three pages each of Gregg Shorthand notes written previously on the job?

1. Can you get all or some of the samples from secretaries or stenographers in your own firm?

2. If not, can some be obtained from a friend's firm?

3. Enclosed is a description of the samples of shorthand needed and of the type of writers required.

Also enclosed is an addressed envelope with fifty cents postage for your convenience in sending the samples to me.

Your name was given me through the courtesy of the Educational Director of the Administrative Management Society. Your assistance will be very much appreciated.

Sincerely yours,

Enclosures

Figure 2. A letter to obtain national samples of Gregg Shorthand Simplified.

DESCRIPTION OF SAMPLES OF GREGG SHORTHAND NEEDED

The procedure to be used to obtain thirty samples from the local regional area will be to ask secretaries or stenographers for samples of shorthand which shall have the following characteristics:

1. Any three consecutive pages of Gregg Shorthand notes.
2. Taken at random.
3. Written on any one day.
4. Written recently within approximately the previous two months.
5. Having content of any general business correspondence such as is ordinarily found in dictated letters during the regular work of the secretary or stenographer.
6. From notebooks used in day-to-day dictation procedures.

No identification is necessary on these samples but please have each writer put three items at the top of the first page as follows:

1. Year of graduation from high school--only the work of those graduating after 1950 can be used.
2. Either "Simplified" or "Diamond Jubilee" for the edition of the text studied. Samples of the older "Anniversary" style are not being studied.
3. A minimum of "two years of instruction" in public high school or the equivalent in content of instruction in Gregg Shorthand in a private business school in order to provide a uniform minimum preparation among writers of the samples. State length of time and name and address of the private business school attended.

Figure 3. Enclosure for collection letter of Figure 2.

September 1, 1964

Dear (Employer):

On August 5, 1964, a request was sent you regarding a national investigation of shorthand as written on the job, "Variations in Gregg Shorthand." The findings may benefit you by contributing to more effective business communication in possible revisions indicated for the theory of shorthand taught to secretaries and stenographers.

The request was for your help in obtaining thirty samples of three pages each of Gregg Shorthand Simplified notes written previously on the job.

1. Can you get all or some of the samples from secretaries or stenographers in your own firm?

2. If not, can some be obtained from a friend's firm?

3. Enclosed is a description of the samples of shorthand needed and of the type of writers required.[1]

Also enclosed in the previous letter was an addressed envelope with fifty cents postage for your convenience in sending the samples to me.

Your name was given me through the courtesy of the Educational Director of the Administrative Management Society. Your assistance will be very much appreciated, and I hope to hear from you soon.

Sincerely yours,

Enclosure

[1]The description referred to is the same as the one on the preceding page.

Figure 4. Follow-up letter for national collection of samples.

APPENDIX B

TABLE IX

SOME TOPICS* OF THE SHORTHAND WRITING IN PREVIEW SAMPLES OF 17,825 WORDS

Sample	
#1.	Refusal of a university chemistry teaching position to an applicant.
2.	Sales training program points.
3.	Preparation of state income tax returns.
4.	Complaint about vacation photographs.
5.	Explanation about $7 difference in billing.
6.	Transcript outlining police department activities.
7.	Refusal of offer of auto gear cutting contract.
8.	General release of parties in a lawsuit.
9.	Notice of design and sale of insurance plans including estate, qualified benefit, profit-sharing, and dividend compensations plans.
10.	Receipt of underwriters' laboratory certificates and deeds of issuance.
11.	Auto insurance claim for towing.
12.	Description of specimen life insurance policy enclosure.
13.	Course guidance for a university student in business education.
14.	Application for real estate broker's license.
15.	Description of credit rating for a loan.
16.	Sales distribution of heaters in Maine.
17.	Overdue payment of life insurance premium.
18.	Life insurance sales promotion.
19.	Request for interest due on mortgage loan.

*Some samples include several letters. Topics listed are representative of each sample and do not necessarily refer to all topics covered in each sample. Variety was sought rather than inclusiveness in order to demonstrate the scope of dictation material transcribed in samples of this study.

Topics taken from Tables IX-XX, pages 94-114, in original dissertation.

APPENDIX C

TABLE XV

SOME TYPES OF BUSINESS FIRMS, DEPARTMENTS, OR ORGANIZATIONAL POSITIONS REPRESENTED BY TOPICS OF PREVIEW SAMPLES

Sample			
#1.	University, graduate chemistry department.	14.	Real estate broker.
2.	Retailing establishment	15.	Bank, loan department.
3.	Accounting department	16.	Heater manufacturer.
4.	Secretary.	17.	Life insurance firm.
5.	Construction firm.	18.	Life insurance firm.
6.	Police department.	19.	Bank, loan department.
7.	Auto gear factory.	20.	Manufacturer of airplane parts.
8.	Law firm.	21.	Life insurance firm.
9.	General insurance firm.	22.	Public grade school.
10.	Fire insurance firm.	23.	Accounting department.
11.	Auto insurance firm.	24.	Electronic tube manufacturer.
12.	Life insurance firm.	25.	Electronic tube manufacturer
13.	University, graduate business education department.		

APPENDIX D

ADDENDUM

TABLE XXXV*

WORDS WITH VARIATIONS IN THEIR SHORTHAND OUTLINES IN PREVIEW SAMPLES OF 17,825 WORDS

Left "s"

ideas
returns
bonds
rates
dates

September
must have
laboratories
excursion
concerning

Right "s"

of (4)
decision
superior
as a result of
excess
sincere

"s" and "x"

vacancies
forms
series
it is
causing

officers
interiors
standards
fixed (2)
very nice

expressed
next (2)
last
Northeast
inconvenience

"o" for "oo"

above (2)
disputed
you
supplemental
July

distribution
August
plus
unable (2)
full

one
contributing
customer
under
assure
up

"oo" for "o"

Vogel (2)
taught
of the (2)
of (3)
of your

of the
cooperation
pocket
default
over

overtime
following
lost

"a" between opposite curves

Edgar
require

"c" between opposite curves

None

"a" in relation to straight structures

conversation

"e" in relation to straight structures

submission

"-ith" joining and its misuse

forth

Use of "-ings"

None

Representation of the word ending "-ther"

further

"-ed"

furnished
completed
reviewed
deceased (2)
required

signed
processed
checked
advised (2)
streaked

explained
disputed
continued
quoted
dated (3)

overlooked
reduced
obtained
stalled
appreciated

equipped
marked
signed
mailed/
informed

supplied
franchised
reissued
approved
refinanced

secured
endorsed
closed
advised
picked

enjoyed
distributed
checked
leased
fixed (2)

placed
received
replaced
maintained (2
discontinued

advised
dropped
examined
charged
assumed
received

"-ded"

forwarded
added
provided

"-t"

None

*Taken from Tables XXXV-XLVIII, pages 129-170 in original dissertation. A listing of each word with a variation and totals was made as a supplementary resource for researchers teachers, and students.

APPENDIX E

ADDENDUM

TABLE XXXVI

TOTAL WORDS WITH VARIATIONS IN OUTLINES OCCURRING MORE THAN ONCE IN PREVIEW SAMPLES OF 17,825 WORDS

Left "s"	"e" between opposite curves	"-ed"	which
None	None	(2) advised continued deceased fixed maintained	(4) amount has been this (6) we have
Right "s"	"a" in relation to straight structures	(3) dated	(9) Sept.
(4)* of	None	Below	Above
"s" and "x"	"e" in relation to straight structures	(2) appreciated at the by classes dated	(2) Vogel conversation in Nov.
(2) fixed next	None	Dear Mr. has been help past place	(4) for of (5) the
"o" for "oo"	"-ith" joining and its misuse	up us we you	
(2) about unable	None	(3) and I have is paid please	
"oo" for "o"	Use of "-ings"		
(2) Vogel of the	None		
(3) of	Representation of the word ending "-ther"		
"a" between opposite curves	None		
None			

*Numbers in parentheses refer to the number of times each word with a variation occurred in the category of the variation.